Guest River Watershed Implementation Plan

March 10, 2014 Public Meeting

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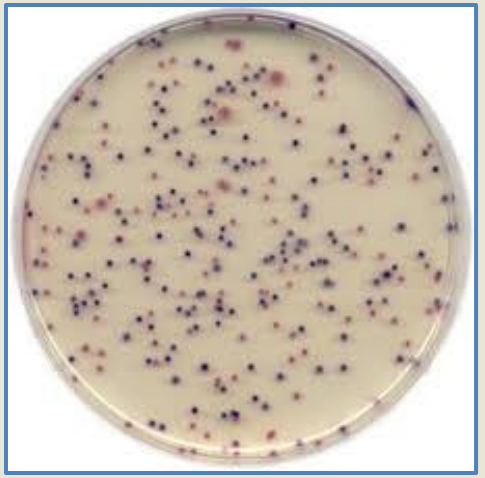
Sediment Load Sources

- **Resource Extraction**
  - Active strip mine
  - Tipples
  - Previously mined land
  - Abandoned mine features
- **Residential/Urban**
- **Agricultural**
  - Cropland
  - Pasture
  - Eroded streambanks
- **Forest**

Bacteria Load Sources

- **Residential/Urban**
  - Straight pipes & failing septic systems
  - Pets
  - Direct to stream; stormwater runoff



- **Agricultural**
  - Beef & horses
  - Direct access to stream; pasture & cropland runoff
- **Wildlife**
  - Deer, turkey, goose, ducks, muskrat, raccoon, beaver
  - Direct to stream; forest & agricultural landuse runoff

Information Utilized in Implementation Actions Quantification

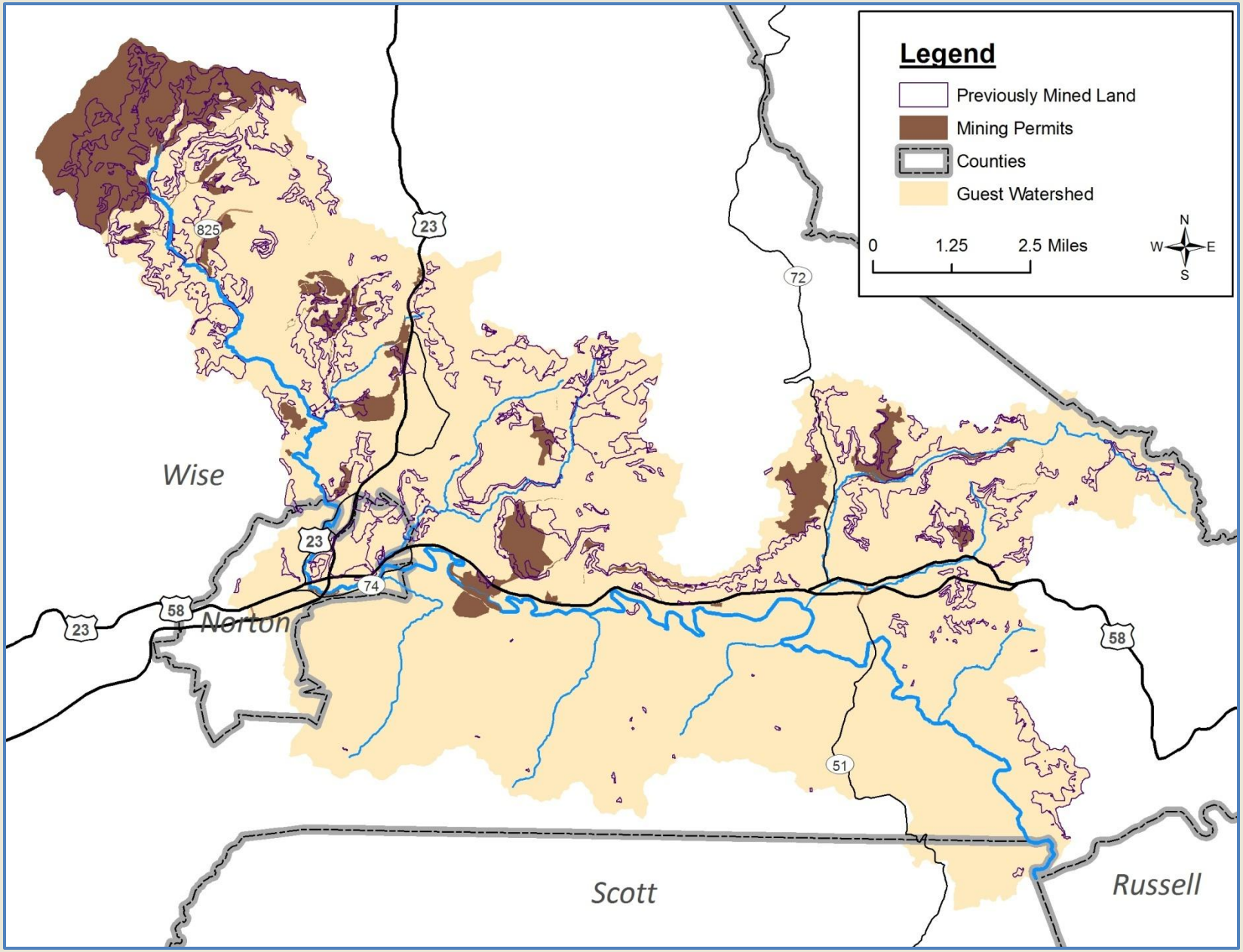
- Integrated Pollutant Source Identification (IPSI)
- TMDL and TMDL IP documents
- Spatial analysis (e.g., GIS)
- Lonesome Pine SWCD records
- Upper Tennessee River Roundtable (UTRR) records
- DCR, DEQ, VDH, DMME, & DOF records
- Input from stakeholders

Resource Extraction Implementation

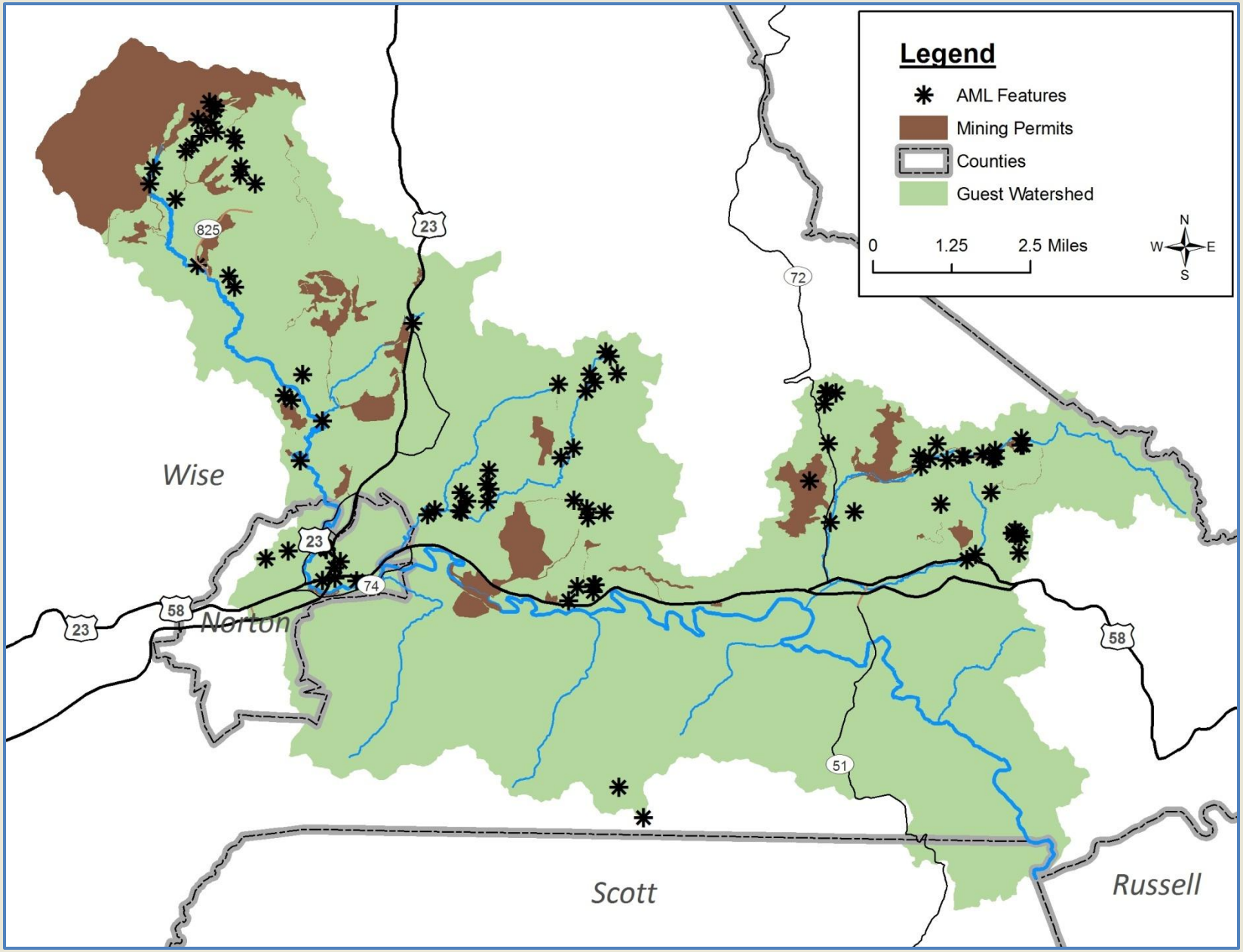
- Sediment loads from AML features, previously mined land, and tipples reduced through:
  - Re-mining at permitted mining sites
  - Re-grading & re-vegetation
  - Infiltration channels, check dams, silt fence, & diversion ditches

About 68 acres of reclaimed AML features in watershed

Previously Mined Land

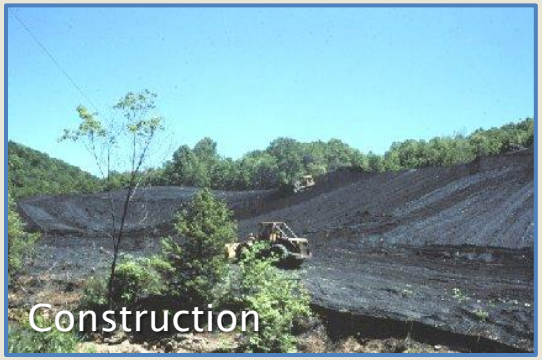


Abandoned Mined Land



Resource Extraction Actions

High Wall Reclamation



Gob Pile Reclamation

Resource Extraction Actions

Silt Fencing

Construction Entrances

Check Dams



Permanent Vegetative Cover


Reforestation

Resource Extraction Needs

Control Measure	Unit	Estimated Units Needed (#)	Average Unit Cost ($)
Re-vegetation	Acres	1,294	1,000
Re-grading	Acres	1,294	2,500
Infiltration Channels	Acres	82	5,000
Check Dams	Acres	82	1,000
Silt Fence	Acres	82	1,500
Diversion Ditches	Acres	82	2,000
Structure Removal	Acres	22	15,000
Technical Assistance	**FTE**	**15**	**50,000**

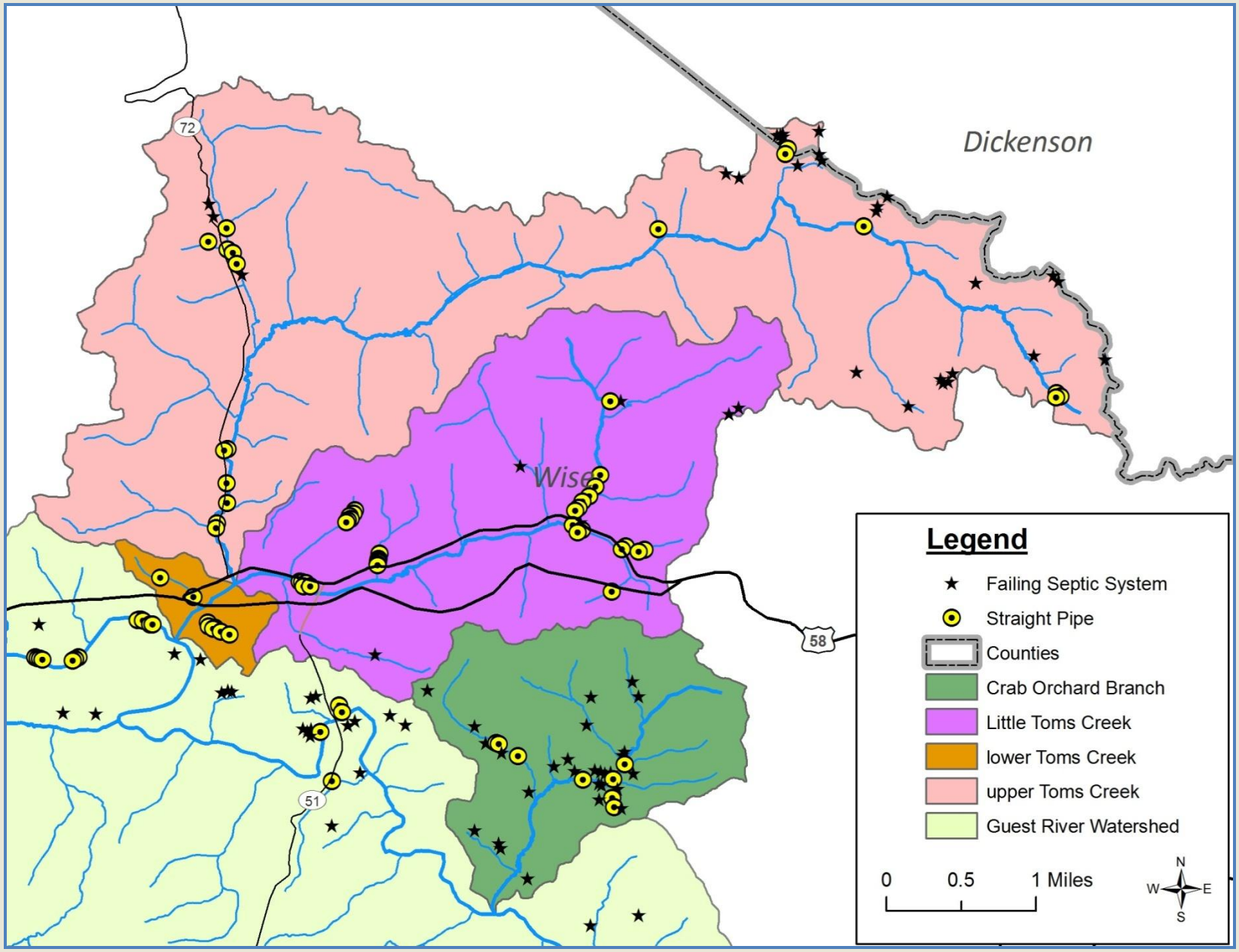
Urban Implementation Actions

On-site Sewage Disposal Systems

- Septic Tank Pump-outs
- Connection to Public Sewer
- Septic System Repair
- New Conventional Septic System
- New Conventional Septic System with Pump
- New Alternative On-site Sewage Disposal System

82 straight pipes and failed septic systems corrected in watershed since 2005

Straight Pipes & Failed Septic Systems



Septic System Pump-out

Septic System Replacement

Septic System Repair

Alternative On-site
Sewage Disposal System

Urban Implementation Actions

Pet Waste Management Components

- Management program
  - Educational materials, disposal stations
- Enzyme digesting composters
  - Individual units in homeowners' yards

Stormwater Runoff Best Management Practices

- Vegetated buffers
- Bioretention (rain gardens) ⇒ Coeburn High School and Coeburn Town Hall bioretention treating about nine acres
- Infiltration trenches
- Increased E&S Control
- Manufactured stormwater BMPs
- Increased storm drain maintenance
- Retention pond retrofits

Pet Waste Composters

Manufactured SW BMP

Vegetated Buffer

Pet Waste Kiosk

Bioretention (rain garden)

Infiltration Trench

Urban Implementation Needs

Control Measure	Unit	Estimated Units Needed (#)	Average Unit Cost ($)
On-site Sewage Disposal Systems			
Septic Tank Pump-outs	System	164	250
Connection to Public Sewer	System	22	3,500
Septic System Repair	System	48	3,000
New Conventional Septic System	System	74	6,000
New Conventional Septic System with Pump	System	10	8,000
New Alternative On-site Sewage Disposal System	System	10	15,000
Pet Waste Management			
Pet Waste Education Program	Program	1	5,000
Pet Waste Enzyme Digesting Composters	System	120	50

Urban Implementation Needs

Control Measure	Unit	Estimated Units Needed (#)	Average Unit Cost ($)
Stormwater			
Vegetated Buffers	Feet	26,400	400
Bioretention	Acres	50	15,000
Infiltration Trench	Acres	50	11,300
Increased Erosion and Sediment Control	Acres	3,100	150
Manufactured Stormwater BMPs	Acres	50	15,000
Increased Storm Drain Maintenance	Acres	3,100	160
Retention Pond Retrofits	Acres	250	2,000
Technical Assistance	**FTE**	**10**	**50,000**

Agricultural Implementation Actions

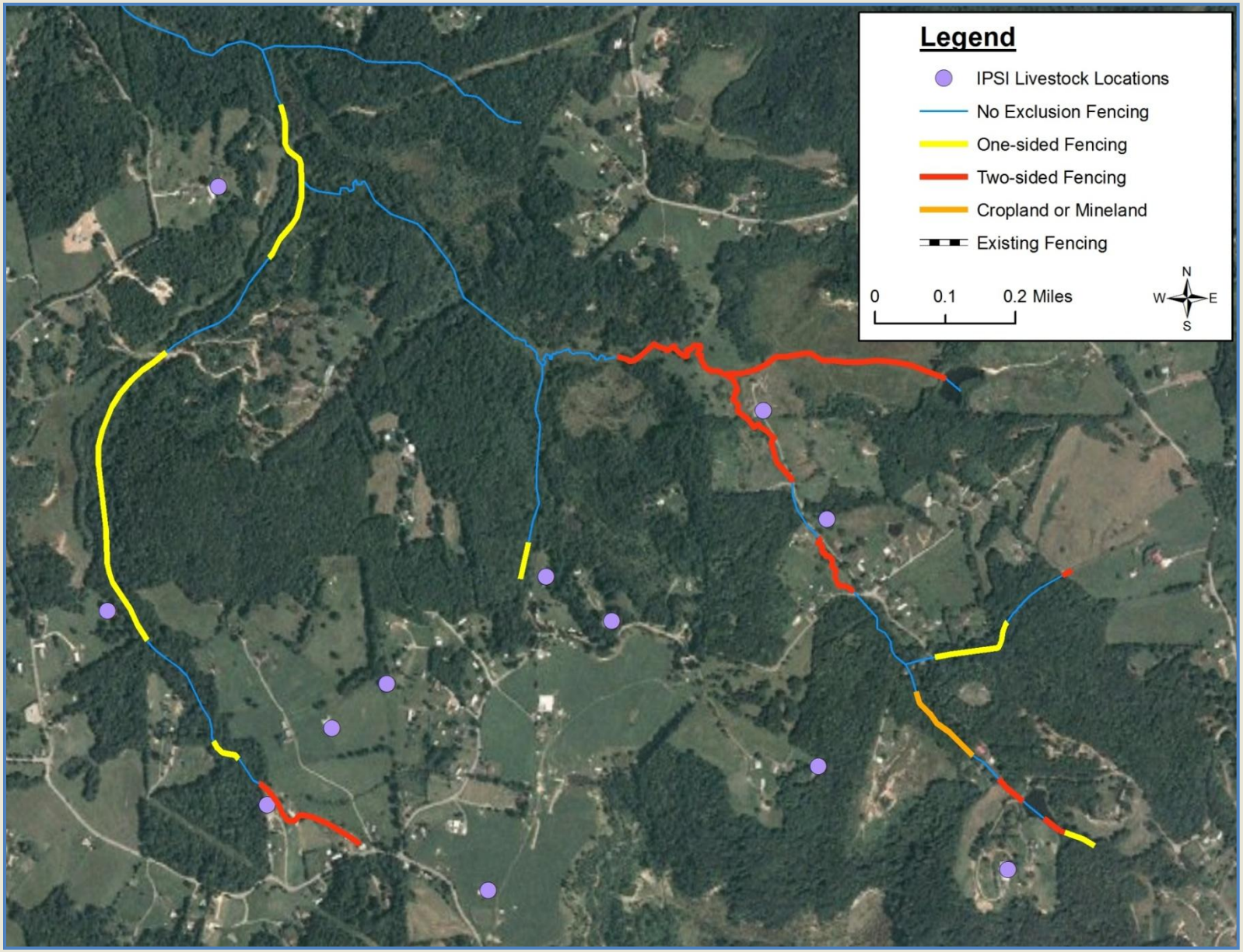
Livestock Stream Exclusion

- Overlaid stream network onto aerial photography to classify stream segments
- Translate fencing needed to livestock exclusion systems
- Federal and state cost-share programs available to provide multiple options for producers

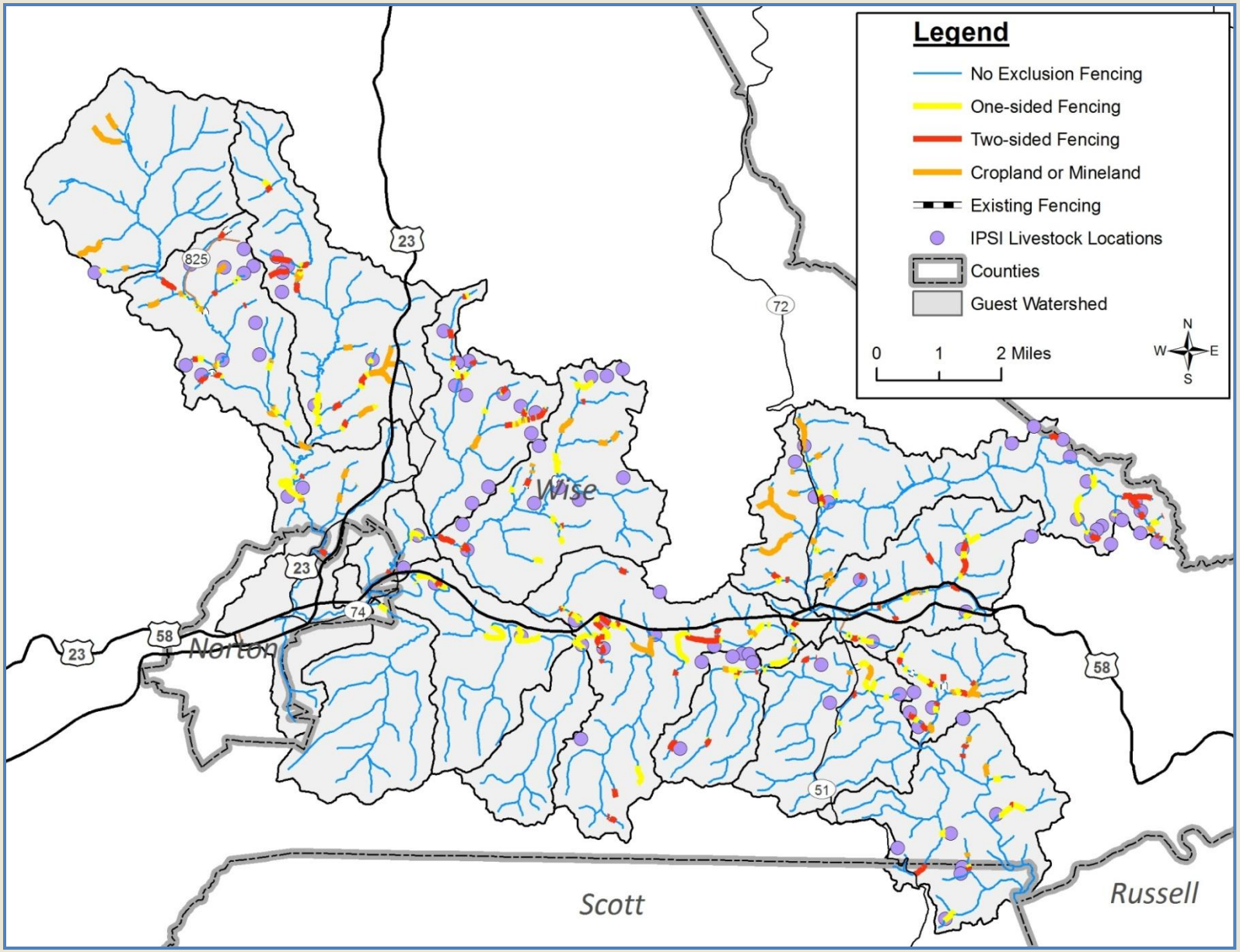
Pasture

- Account for bacteria and sediment reduction provided by livestock exclusion systems
- Reduce bacteria and sediment through improved pasture management (*e.g.*, rotational grazing)

Livestock Exclusion Fencing



Livestock Exclusion Fencing



Livestock Exclusion Fencing

	Sepulcher Creek	Toms Creek	Little Toms Creek	Crab Orchard Branch	Guest River						TOTAL
					Main Stem	Bear Creek	Burns Creek	Clear Creek	Pine Camp Creek	Yellow Creek	
Perennial stream length ,ft (mi)	120,303 (22.8)	163,456 (31.0)	86,029 (16.3)	42,604 (8.1)	629,906 (119.3)	104,306 (19.8)	37,924 (7.2)	71,460 (13.5)	41,880 (7.9)	57,498 (10.9)	1,355,366 (256.7)
Existing exclusion fencing (ft)	**0**	**0**	**0**	**1,696**	**3,880**	**1,992**	**0**	**0**	**0**	**805**	**8,373**
One-sided fencing needed (ft)	6,879	8,545	6,297	3,787	44,733	8,600	1,144	826	1,723	3,785	86,320
Two-sided fencing needed (ft)	15,409	19,367	12,230	8,574	43,972	8,210	0	0	4,228	11,481	123,471
Total Fencing Needed, ft (mi)	**22,288 (4.2)**	**27,912 (5.3)**	**18,527 (3.5)**	**12,361 (2.3)**	**88,705 (13.8)**	**16,810 (3.2)**	**1,144 (0.2)**	**826 (0.2)**	**5,951 (1.1)**	**15,267 (2.9)**	**209,791 (39.7)**

Exclusion Fencing & Riparian Buffer

Watering Trough

Hardened Crossing

Rotational Grazing

Agricultural Implementation Needs

Control Measure	Unit	Estimated Units Needed (#)	Average Unit Cost ($)
Livestock Exclusion			
Livestock Exclusion System with 35’ buffer	System	78	26,000
Livestock Exclusion System with 10’ setback	System	18	17,000
Small Acreage Grazing System with 35’ buffer	System	2	9,000
Stream Protection with 35’ buffer	System	3	5,000
Additional Streambank Stabilization	Feet	23,710	20
Pasture			
Prescribed Grazing	Acres	1,579	870
Pasture and Hayland Planting	Acres	714	155
Disturbed Area			
Re-vegetation	Acres	7	1,000
Technical Assistance	**FTE**	**10**	**50,000**

Implementation Cost

- Control Measure Installation Cost
  - Number of units multiplied by unit cost
- Technical Assistance (TA)
  - Full time equivalents multiplied by unit cost
- Total Cost = Installation Cost + TA Cost


Livestock Water Source

Blue Ridge
Environmental Solutions, Inc.

Agricultural Funding Example

Example Scenario

- ✓ Participates in Virginia Agricultural BMP Cost-share and Tax Credit Programs
- ✓ Installs a LE-1T Livestock Exclusion System

Cost / Credit	$
Average system cost	25,000
85% Cost-share	-21,250
25% Tax credit	-940
Cost to Producer	**2,810**

Residential Funding Example

Example Scenario

- ✓ Replaces failing septic system with new septic system
- ✓ Participates in Virginia BMP Cost-share Program
- ✓ Qualifies for 50% cost-share rate based on income level

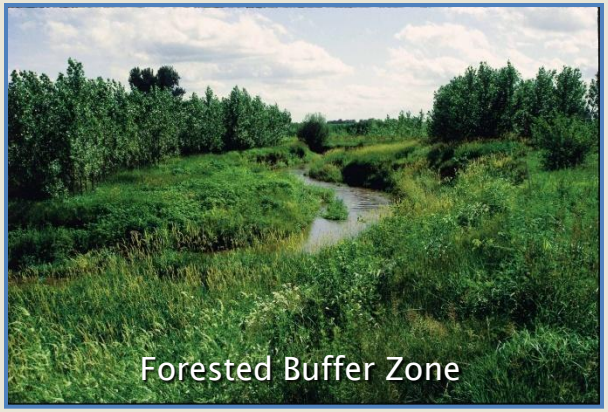
Cost / Credit	$
Average system cost	6,000
50% Cost-share rate	-3,000
Cost to Homeowner	**3,000**

Measurable Goals & Milestones

- **Establish Goals**
  - Stage I: meet bacteria TMDL allocation
  - Stage II: meet sediment TMDL Allocations
- **Create milestones**
  - Implementation (number of practices)
  - Water quality (reduction in bacteria/sediment)


Exclusion Fencing with Buffer

- **Evaluate progress**
  - DMME, SWCD, VDH, and UTRR track installations
  - DEQ monitors water quality


Forested Buffer Zone

TMDL Implementation Strategy

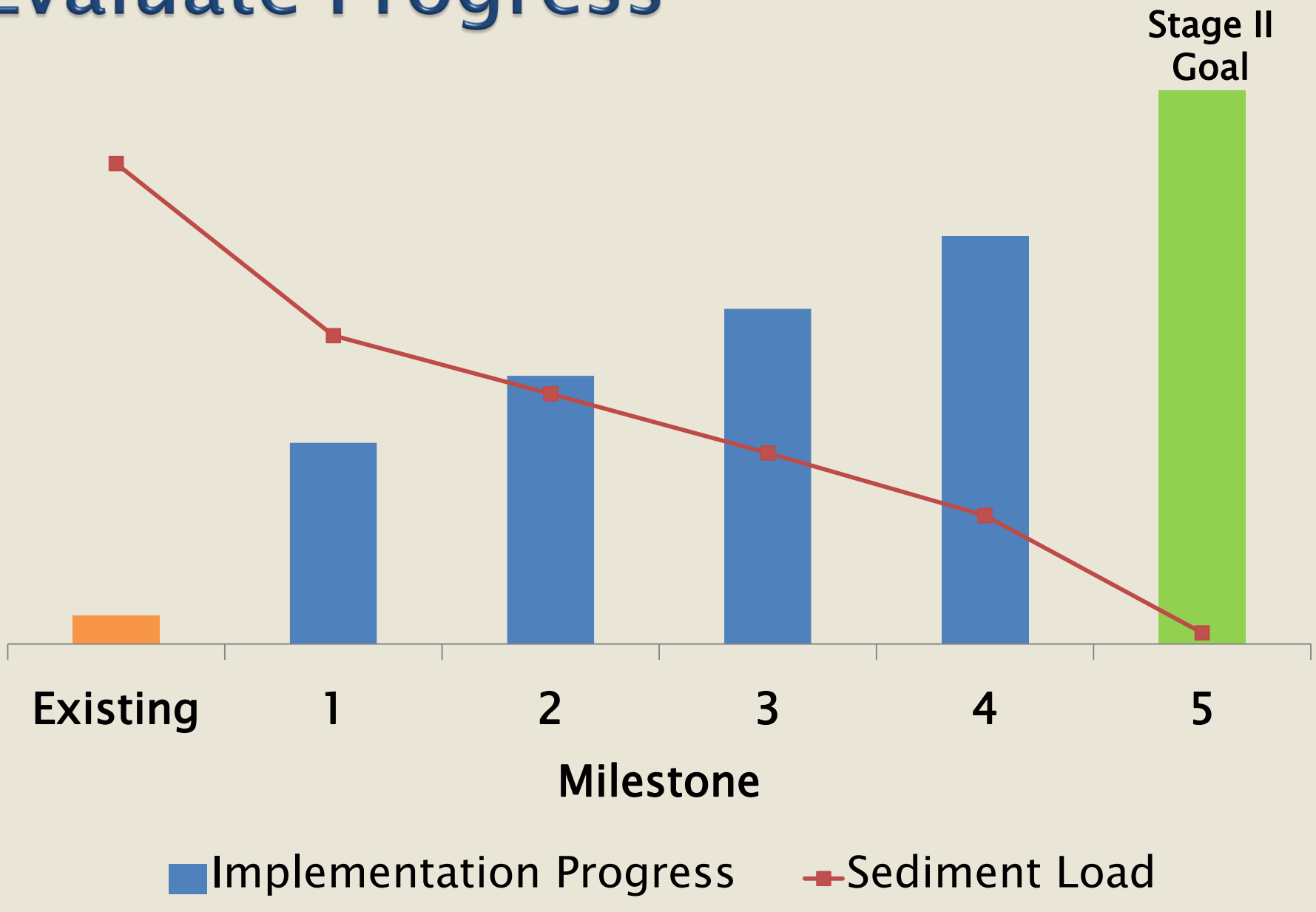
- **15-year timeline**
  - **Stage I** ⇒ first 10 years
    Goal: removal from bacteria impaired waters list
    (bacteria standard exceedance rate < 10.5%)
  - **Stage II** ⇒ continue to 15 years
    Goal: removal from sediment impaired waters list
    (sediment reduced by 56%)

Septic System Replacement

Improved Pasture Management

Mined Land Reclamation

Evaluate Progress



Contact Information

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